



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

THE

Journal of the Society of Arts,

AND OF

THE INSTITUTIONS IN UNION.

110TH SESSION.]

FRIDAY, MAY 27, 1864.

[No. 601. VOL. XII.]

Announcements by the Council.

PRESENTATION OF MEDALS AND PRIZES.

His Royal Highness the Prince of Wales, K.G., President of the Society, has been pleased to appoint Friday, the 24th of June, at three o'clock, to present the medals and prizes awarded during the present Session. The Presentation will take place at Willis's Rooms, King-street, St. James's. Members will be admitted by ticket only, for which application should be made to the Secretary; each ticket to admit the member and one lady. The tickets will be ready for delivery on and after the 1st June.

DWELLINGS OF THE LABOURING CLASSES.

The special Conference on this subject commenced yesterday at the Society's House, and will be continued this day (Friday, the 27th inst.), commencing at 11.30 precisely. A Report of the proceedings will appear in next week's *Journal*.

CONVERSAZIONE.

The Council have arranged for a Conversation at the South Kensington Museum on Thursday evening, the 16th June, cards for which will shortly be issued.

NOTICE TO INSTITUTIONS AND LOCAL BOARDS.

The Thirteenth Annual Conference between the Council and the Representatives of the Institutions in Union and Local Boards, will be held on Thursday, the 16th June, at Twelve o'clock, noon. WILLIAM HAWES, Esq., Chairman of the Council, will preside.

Secretaries of Institutions and Local Boards are requested to forward, as soon as possible, the names of the representatives appointed to attend the Conference.

The Council will lay before the Conference the Secretary's Report of the proceedings of the Union for the past year, and the Results of the Examinations.

The Programme of Examinations, Elementary and Final, for 1865, will also be laid before the Conference.

The following subjects are suggested for discussion :—

1. In what manner can the agents of the District Unions, who have been appointed agents to the Society of Arts in their respective localities, best carry out the objects of the Society, and promote the welfare of the Institutions?

2. The advantages of District Unions; how the Society of Arts may best promote their formation, and aid them when formed?

3. The best means of developing the social character of the Institutions.

4. The best mode of promoting Popular Readings as a department of the work of Institutions.

5. What is the influence of the Working Men's Clubs, formed in various localities, on the educational character of the Institutions in those localities?

6. The best means of providing for the Education of Women and Girls after they have left their Day-schools.

7. Would it be desirable to add "Needlework" to the subjects of Examination in the Programme of the Society of Arts?

8. How can Physical Education be promoted by the Institutions, by the District Unions, and by the Society of Arts?

9. The advantages of "Youths' Institutes," i.e., separate Institutes, or separate departments of Institutes, for Youths?

10. The Prizes for Art-workmanship annually offered to Art-workmen by the Society of Arts; how far can the District Unions, Local Boards, and Institutions, assist in giving publicity to this competition, and in encouraging those likely to be competitors?

11. Would it be desirable to allow a certain limited share in the government of Institutions to such of the members as may have obtained Certificates in the Examinations?

12. If the Society of Arts were to publish a calendar, with the names of all candidates who have obtained certificates and prizes from 1856 to 1864, at a price to be named, would there be any considerable number of copies subscribed for?

Notice of any other subjects which representatives may desire to bring forward for discussion should be given to the Secretary of the Society of Arts.

The Secretary of each Institution is requested to forward, by book-post, a copy of the Annual Report of his Institution.

Representatives of Institutions and Local Boards attending the Conference are invited to the Society's Conversazione, at the South Kensington Museum, on the evening of the same day (16th June), and will receive cards on application at the Society's House, on the day of the Conference.

PRIZES FOR ART-WORKMEN.

The Council of the Society of Arts offer prizes to Art-Workmen as follows:—

1ST DIVISION.

WORKS TO BE EXECUTED FROM PRESCRIBED DESIGNS.

CLASS 1.—CARVING IN MARBLE, STONE, OR WOOD.

(a.) *The Human Figure*.—Two prizes of £15 and £7 10s. respectively. Subject:—The Boy and Dolphin cast from a chimney-piece, ascribed to *Donatello*.

(b.) *Ornament*.—Two prizes of £10 and £5 respectively. Subject:—A carved chair-back.

(c.) *Ornament*.—Two prizes of £10 and £5 respectively. Subject:—A Gothic bracket.

(d.)—Two prizes of £20 and £10 respectively. Subject:—A design by *Holbein*, as an *Inkstand* or *Watch-Holder*.

(e.)—Two prizes of £15 and £7 10s. respectively. Subject:—*Head of a Harp* of the period of Louis XVI.

(f.) *Ornament*.—Two prizes of £10 and £5 respectively. Subject:—An Italian picture frame.

CLASS 2.—REPOUSSÉ WORK IN ANY METAL.

(a.) *The Human Figure as a bas-relief*.—Two prizes of £10 and £5 respectively. Subject:—*Raphael's* "Three Graces."

(b.) *Ornament*.—Two prizes of £5 and £3 respectively. Subject:—A Flemish salver.

CLASS 3.—HAMMERED WORK, IN IRON, BRASS, OR COPPER.

Ornament.—Two prizes of £7 10s. and £5 respectively. Subject:—A portion of the Pediment of a Gate (German work, date about 1700).

CLASS 4.—CARVING IN IVORY.

(a.) *Human Figure in the round*.—Two prizes of £15 and £10 respectively. Subject:—An Ivory, by *Piainigo*.

(b.) *Ornament*.—Two prizes of £7 10s. and £5 respectively. Subject:—A pair of *Tablets*.

CLASS 5.—CHASING IN BRONZE.

(a.) *The Human Figure*.—Two prizes of £10 and £5 respectively. Subject:—A reduced copy of "*Clytie*."

(b.) *Ornament*.—Two prizes of £10 and £7 10s. respectively. Subject:—A cabinet, by *Goutier*.

CLASS 6.—ETCHING AND ENGRAVING ON METAL—NIELLO WORK.

Ornament.—Two prizes of £10 and £5 respectively. Subject:—Arabesques, by *Lucas Van Leyden*, 1528.

CLASS 7.—ENAMEL PAINTING ON COPPER OR GOLD.

(a.) *The Human Figure*.—Two prizes of £10 and £5 respectively. Subject:—*Raphael's* design of the "Three Graces."

(b.) *Ornament*.—Two prizes of £5 and £3 respectively. Subject:—A German arabesque (16th century).

CLASS 8.—PAINTING ON PORCELAIN.

(a.) *The Human Figure*.—Two prizes of £10 and £5 respectively. Subject:—*Raphael's* "Two Children," in the cartoon of "*Lystra*."

(b.) *Ornament*.—Two prizes of £5 and £3 respectively. Subject:—Arabesques, by *Lucas Van Leyden*, 1528.

CLASS 9.—DECORATIVE PAINTING.

(a.) *Ornament*.—Two prizes of £5 and £3 respectively. Subject:—An ornament, from *Castel R. Pandino*, near Lodi.

(b.) *Ornament*.—Two prizes of £5 and £3 respectively. Subject:—A picture frame, in the South Kensington Museum.

CLASS 10.—INLAYS IN WOOD (MARQUETRY, OR BUHL), IVORY OR METAL.

Ornament.—Two prizes of £5 and £3 respectively. Subject:—A specimen.

CLASS 11.—CAMEO CUTTING.

(a.) *Human Head*.—Two prizes of £10 and £5 re-

spectively. Subject:—*Wyon's* heads of the Queen and the Prince Consort, on the Juror's medal of 1851.

(b.) *Animal*.—Two prizes of £10 and £5 respectively. Subject:—*Wyon's* "*St. George and the Dragon*," on the Prince Consort's medal.

CLASS 12.—ENGRAVING ON GLASS.

Ornament.—Two prizes of £5 and £3 respectively. Subject:—Arabesques by *Lucas Van Leyden*, 1528.

CLASS 13.—WALL MOSAICS.

Human Head.—Two prizes of £15 and £10 respectively. Subject:—A work by *Bertini*, of Milan.

CLASS 14.—GEM ENGRAVING.

(a.) *Human head*.—Two prizes of £10 and £5 respectively. Subject:—An original Gem.

(b.) *Full-length figure*.—Two prizes of £10 and £5 respectively. Subject:—An original Gem.

CLASS 15.—DIE SINKING.

Human head.—Two prizes of £10 and £5 respectively. Subject:—The head of the Prince Consort, by *Wyon*, on the Society's medal.

CLASS 16.—GLASS BLOWING.

Ornament.—Two prizes of £7 10s. and £5 respectively. Subject:—An original in the South Kensington Museum.

CLASS 17.—BOOKBINDING AND LEATHER WORK.

(a.) *Bookbinding*.—Two prizes of £7 10s. and £5 respectively. Subject:—An Italian specimen in the South Kensington Museum.

(b.) *Leatherwork*.—Two prizes of £7 10s. and £5 respectively. Subject:—A specimen of boiled and cut leatherwork for the outside covering of a jewel casket, the original being in the South Kensington Museum.

CLASS 18.—EMBROIDERY.

Ornament.—Two prizes of £5 and £3 respectively. Subject:—A German example in the Green Vaults at Dresden, or an Italian Silk in the South Kensington Museum.

2ND DIVISION.

WORKS TO BE EXECUTED WITHOUT PRESCRIBED DESIGNS.

WOOD CARVING.

(a.) *Human figure in alto or bas relief. Animals or natural foliage may be used as accessories*. 1st prize of £25 and the Society's Silver Medal. 2nd prize of £15. 3rd prize of £10.

(b.) *Animal or still-life. Fruit, flowers, or natural foliage, may be used as accessories*. 1st prize of £10. 2nd prize of £7 10s. 3rd prize of £5.

(c.) *Natural foliage, fruit, or flowers, or conventional ornament in which grotesque figures or animals may form accessories, preference being given where the work is of an applied character for ordinary decorative purposes, as representing commercial value*. 1st prize of £10. 2nd prize of £7 10s. 3rd prize of £5.

All articles for competition must be sent in to the Society's house on or before Saturday, the 26th of November, 1864, and must be delivered free of all charges. Each work sent in competition for a Prize must be marked with the Art-workman's name, or, if preferred, with a cypher, accompanied by a sealed envelope giving the name and address of the Art-workman.

Photographs, engravings, &c., of the above subjects, may be purchased at the Society's house at cost prices. Full particulars, with conditions, may be obtained from the Secretary of the Society of Arts, to whom all persons desiring to become competitors should apply.

Proceedings of Institutions.

METROPOLITAN ASSOCIATION FOR PROMOTING THE EDUCATION OF ADULTS.—The committee of the above Association, being desirous of giving encouragement to physical exercises and games of strength and skill among the working classes, and also to afford the members of the Literary and Mechanics' Institutions, Working Men's Clubs, Young Men's Societies, &c., in union with the Association an opportunity for a social re-union, have arranged for a gathering at the Crystal Palace on Monday, June 27. In addition to the various attractions at the Palace, arrangements have been made for a series of athletic sports, for which money prizes will be given; there will also be an open air concert of 800 voices, under the direction of Mr. G. W. Martin; a balloon ascent; a grand organ performance; and a prize contest of cadet bands. The Band of the Crystal Palace Company will play during the day within the Palace, and the Band of the Greville House Working Men's Institute, and the Kingsland Sub-division of Metropolitan Police, N Division, in the Palace grounds. Excursions are being organised by Institutions in union, all expenses, apart from the purchase of tickets, being borne by the Association.

YORKSHIRE UNION OF MECHANICS' INSTITUTIONS.—The annual conference of this Union was held on the 18th instant, in the lecture-hall of the Mechanics' Institution, Surrey-street. Breakfast was provided in the building for the delegates and friends, and shortly after eleven o'clock the business meeting commenced. The chair was taken by Edward Baines, Esq., M.P. for Leeds, President of the Union, and amongst the gentlemen present were J. A. Roebuck, Esq., M.P.; Rev. Canon Sale, D.D., Vicar of Sheffield; Rd. Rumney, Esq., Vice-President of the Manchester Mechanics' Institution, and others. After some preliminary business, the Conference next year was fixed to take place at Stockton-on-Tees. Mr. BUCKMASTER, of the Department of Science and Art, introduced the first subject for discussion—"The promotion of class instruction in science, and the aid afforded by the Department of Science and Art." He gave an outline of the scheme of the department, upon which a discussion ensued. One of the representatives expressed some doubt whether the certificated teachers could depend upon the promises of the department. In his opinion the department would probably in a few years withdraw its support. Another gentleman gave an account of the progress of the Manchester Mechanics' Institutions, but expressed his conviction that the system of payment to teachers induced them to devote all their energies to training boys in special subjects, to the neglect of that which was more important—a good, sound, commercial and general education. Mr. CHRISTOPHER THOMPSON introduced the subject of "The system of elementary examinations as an incentive to pupils of elementary classes, as well as a preliminary to the final examinations of the Society of Arts." Rev. HENRY SOLLY introduced the next subject, "How far Mechanics' Institutes can legitimately introduce more attractive features so as to induce larger numbers of the operative classes to attend them." The merits of Working Men's Clubs were discussed and various opinions were expressed as to the advisableness of grafting the "club" on to the "institution." Several delegates who advocated the retention of the present system, contended that the Working Men's Clubs would thin the ranks of the institutes, but others argued that the workmen who entered the clubs were altogether a different class from those who recruited the classes in the Mechanics' Institutions. The Rev. T. HINCKS warned the delegates against departing from the strict line of the work which the institutes were established to carry out. It would be a fatal day for Mechanics' Institutions when

their managers turned their backs upon the old course, and began to compete with places of a lower character. Mr. FISHER was in favour of so modifying these institutions that they might become attractive to young persons. Mr. RUMLEY showed that in every place in Lancashire where prominence had been given to amusements the institutions had failed; wherever it had kept to the work of class instruction, it had succeeded. Mr. ROEBUCK, M.P., moved, "That this meeting desires gratefully to acknowledge the long-continued service of Edward Baines, Esq., M.P., as President of the Yorkshire Union of Mechanics' Institutions, and thanks him, and warmly, for the courtesy and ability with which he has performed the duties of chairman at this conference of delegates." It had always been a dream of his—to see the working classes of this kingdom raised up to the enjoyment experienced by the intellectual classes that are above them. He believed that time was approaching. A great change was now taking place among the working classes of this kingdom. On Whit-Monday 35,000 people met at the Crystal Palace, and 30,000 at the Horticultural Gardens, and there was not the slightest disturbance, all having conducted themselves well. He believed that the institution, of which Mr. Baines was so worthy a president, would bring about that which had been his life-long dream—the raising of the working classes up to the due intellectual enjoyment that was now the appanage of the richer classes of society. The motion was carried with acclamation, and in acknowledging the compliment, the CHAIRMAN said he rejoiced to be able to do anything to raise the intellectual and moral condition of the working classes. The conference then separated. The delegates dined together in the Cutlers' Hall. A meeting in the evening was held, and was numerously attended. The Duke of ARGYLL, Lord Privy Seal, took the chair, and, in opening the proceedings, said they were met to promote the prosperity of the Union of the Yorkshire Mechanics' Institutes. They knew that it was almost a joke that mechanics' institutions were institutions in which there were no mechanics. He did not think that was true, as regarded the mechanics' institutions of Yorkshire. At the same time it was perfectly true that the class of mechanics and artisans had, to a large extent, betaken themselves to working men's clubs and other institutions of a similar kind; but if he rightly understood the information which had been given to him by Mr. Baines, this union was not merely a union of mechanics' institutions strictly so called, but those who carried it on would be very glad to see connecting themselves with this union all institutions formed for the education of the middle and working classes of Yorkshire. The great advantage of such unions was that they extended to the education of the working classes the stimulus of examinations, introducing that principle of competition which had been found so valuable in our public schools and universities. Another advantage would be that the education would become definite, and less slovenly in its character than at present. After advocating systematic study, and urging the importance of education in elementary subjects, his Grace referred to the Examinations of the Society of Arts and of the Department of Science and Art, saying that a main object of mechanics' institutions was to give scientific instruction to artisans in their various trades and occupations. In that respect, as in others, they had very much failed; but an excellent system had been established by which certificates and prizes were given to those who qualified themselves for industrial avocations. In this field the middle and working classes were left almost to themselves, inasmuch as science was almost neglected in our great public schools. He earnestly impressed upon the union the necessity of giving great attention to this part of their work. As to the bearing of these institutions upon elementary education, it was a most extraordinary circumstance that England should have come to be what she was without having had a system of national education, such as Scotland had had to her great advantage

ever since the Reformation. It was a question of great and growing importance as to what great ends, what good objects, could be obtained by legislation; what were those which must be left to be attained, if at all, by the public; and what were those which we were entitled to procure, if we could, by the higher forms of legislative action. In former times the great evil was not over but under legislation. There had been a gradual reform in this respect, but concurrently with the progress of free trade came the conviction of the necessity for direct legislation in the matter of education. He looked upon the Factory Education Act as of the greatest importance, and wished to see it more extensively applied to other classes of the community. He believed the master manufacturers generally had cordially co-operated in this matter. That the working people were, in one sense, highly educated, was shown by their conduct during the distress, and we had already proved in this country that the best way to make the people fit for freedom was simply to make them free. Another advantage of these institutions was that they promoted a cordial union and co-operation of classes. It was through such unions as this that they might hope to see the various classes of our country "Bound each to each by natural piety." Mr. ROEBUCK, M.P., in moving the adoption of a resolution expressing approval of the object of the union, said he had witnessed to-day events that to him had appeared important and of exceedingly good augury. He had seen met together a large body of thinking men, earnestly intent on promoting better education among the working classes of this country, propounding each his own particular views, with the greatest possible courtesy manifested by all to all; and throughout the whole discussion not one single word or any appearance of anger was manifested. That appeared to him to be an omen of good. He had often advocated the opinion that there was nothing in the necessity of earning a livelihood by manual labour that degenerated the mind of a man or his character, and he knew no reason why the working man could not be as much a gentleman as the greatest in the land. It was also a good augury that his grace should have honoured them with his presence. The aristocracy now interested themselves to raise, ennoble, and refine the classes they governed: and he took it to be one of the most beneficial things that could happen amongst any people that its leading men were interesting themselves in the fortunes and happiness of those around them. With regard to the interference of the State in education, he had at one time been opposed to it, but he had altered his opinion. He believed the time was rapidly approaching when the State would understand what it ought to do with regard to popular education. Every year would confirm the opinion that the education of the people was amongst the first and most important duties of Parliament. Mr. JOHN MARSHALL seconded the resolution, and Mr. EDWARD BAINES, M.P., explained the operations of the Yorkshire Union of Mechanics' Institutes, and proposed a resolution to the effect that it was "especially deserving of a continued and increased amount of public sympathy and support." Mr. RUMLEY, President of the Lancashire Union of Mechanics' Institutes and of the Manchester Institute, in seconding the resolution, said that the success of these Institutions depended more on the directors of them than on anything else. If the right men were at the head, the prosperity of an Institution was secured. The Rev. CANON SALE, D.D., moved—"That this meeting warmly acknowledges its appreciation of the great and valuable services rendered by the West Riding Educational Board to the Institutes of Yorkshire, in promoting the adoption of the system of examinations of the Society of Arts, and all other examinations in which the members of institutes may participate." He expressed his sympathy with the object of mechanics' institutes. Mr. DUNN seconded the resolution. The Mayor proposed a vote of thanks to the Duke of Argyll, which was duly acknowledged.

GOLD MINING IN VICTORIA.

By MR. PHILIP A. EAGLE.

CHAP. I.

HISTORICAL SKETCH—MANAGEMENT—PRODUCE—CAUSES OF DECLINE—POPULATION—REMARKS.

The desire for gold has given the impulse to almost every great movement which has contributed to the distribution of the human race.

We learn from history the numerous conquests, invasions, and explorations, that have been effected under the direct influence of what the poet designates the "auri sacra fames;" how in the middle ages unparalleled hardships were endured in the eager search for some hidden Eldorado; how lands were depopulated by exterminating warfare, and again repopled by the adventurous thousands of the old world.

But the most signal exhibition of the power of the precious metal was reserved for the 19th century, and in the development of the two chief gold-producing countries of modern times, we witness a progress that has no parallel in the annals of colonisation.*

The winter of 1851 was a memorable epoch in the history of Victoria. Its political enfranchisement, the erection of the settlement into an independent province, was almost immediately followed by the finding of gold in several parts of the territory.

The first public announcement of a gold field was made on the 5th of July, and within a space of five weeks, Ballarat, Mount Alexander, Clunes, and Anderson's Creek, were opened. Gold had been found at Port Philip prior to 1851. Brentani's nugget (a mass of gold), obtained in the Pyrenees in 1846, and a number of small specimens of native gold, which had been picked up at various times by station owners and shepherds in other parts of the settlement, added to the more recent discoveries of Dr. Bruhn (a mineral explorer who commenced his labours in January, 1851) near Parker's station, as far back as April—and before the finding by Hargraves—may be said to have aroused attention to the auriferous deposits in the colony. The first report was made by a Mr. Campbell, who, in company with a squatter, picked up pieces of gold in quartz at Clunes, in March, 1850, but the owner of the station (Donald Cameron), apprehensive of injury to his "run" following the announcement, concealed the discovery. On the 10th June, 1851, Mr. Campbell informed Mr. Graham, M.L.C., that within a radius of 15 miles of Burn Bank, on another station run, he had procured gold. Dr. Bruhn dispatched his specimens to the gold discovery committee, which, however, were not received until the 30th June. Michell's party exhibited specimens on the 5th July, which they had obtained at Anderson's Creek, Yarra ranges, and this was undoubtedly the first proved gold field in Victoria. Esmond's discovery at Clunes was also made known at Geelong on the same day (5th July), and Hiscock (who had for some time instituted a search for gold in his neighbourhood), found at Buninyong, the prelude to Ballarat, on the 8th August. To each of these gentlemen (with the exception of Dr. Bruhn, who received £500) the government awarded £1,000. The earliest disclosure of the mineral wealth of Forest Creek is due to a shepherd, named Christopher Peters, who was employed on Barker's station. It appears that Peters found alluvial gold at Specimen Gully on the 20th July, and immediately associated with him three others (also in the same employ), to aid him in reaping the benefit of his exciting discovery. They continued to work the ground with secrecy and success during the following month. On the 1st of September, having become uneasy as to the consequences which might accrue from their unauthorised appropriation of the produce, one of the men, on behalf of the party, "to prevent

* Within the past 12 years the population of the colony of Victoria has increased eightfold.

them getting into trouble," caused to be published in a Melbourne journal an announcement of the situation of their workings. This notice, ambiguously worded, and rendered still more so by the locality being described as "at Western Port," introduced to the world the treasures of Mount Alexander. The richness and extent of the two last-named fields soon withdrew attention from the minor discoveries of Esmond, Michell, and others.

The differences which, at an early period, existed between the authorities and the miners at Ballarat, and which terminated in the painful affair of the Eureka Stockade, partially suspended operations on a favourite ground, but a short interval (improved by an official administration less obstructive) sufficed to witness its re-occupation.

Thenceforth the future of Ballarat was to be scarcely less brilliant than the experience of old "Canadian" times.

Looking at the successful results which have crowned the system of amalgamation; at the extraordinarily prolific character of the ground at great depths—a second and even a third "bottom" having been penetrated—it would be difficult to predict to what eminence this district may not yet attain as a seat of mining enterprise.

It was not until the opening up of Tarrangower, about the end of 1853, that any large migration marked a decline in the importance of Mount Alexander, hitherto the great centre of attraction.

The successful explorations of Capt. Mechosk and others, however, drew away considerable numbers, and from this period a succession of promising "rushes" followed each other at brief intervals.

Porcupine Flat was barely occupied before the wealth of the Trans-Loddon gold fields was disclosed, and the "sweet vale of Avoca" suddenly became the cynosure to which all eyes were directed. It again, however, was deserted for the auriferous spurs and flats which were found to intersect the wide sheep run held by Norman Simson—the present Maryborough-field. This discovery was followed by the opening up of the Creswick, Blackwood, Alma, Inkerman, and Fiery Creek diggings, during which period upwards of three-fourths of the mining class had crossed the Loddon and Bet-Bet, and had extended even as far as the Wimmera.*

Soon afterwards glowing reports came from across the Pacific, and the diggers in large numbers rapidly abandoned the *placers* of Victoria for the alleged discoveries in Peru. A *furor* for new fields had now set in, and successive stampedes to the Rocky River and other places of New South Wales, tended to a considerable thinning of the population. It was at this juncture that the importance of the Dunolly district became known, the wide leads of which, closely followed by the opening up of Chinaman's Flat, and in the ensuing winter of the extensive grounds of Ararat and Pleasant-creek, for some time afforded profitable employment to the miners.†

But with the great western fields the discoveries appeared to have terminated. A long period of inactivity followed, and migratory proclivities became general.

Towards the close of the winter of this year (1858) reports of the discovery of gold at Port Curtis, on the Eastern Coast, were circulated. These were listened to with eagerness by the miners, and the reported "finds" soon assumed the most attractive dimensions—penny-weights became ounces, ounces pounds, and so on even up to hundredweights. In a few weeks, notwithstanding the absence of any reliable information as to the value of the

Canoon field, an exodus from the colony took place, only equalled in number by that of a more recent date to New Zealand. A magnificent country was explored, teeming with great natural wealth in the shape of a fertile soil, but possessing little auriferous value, and, but for the promptness of the Victorian Government, the "rush to Port Curtis" must have had a termination little less disastrous than that which attended the ill-advised expedition to Callao.

The depression of the mining interest in Victoria was, however, but temporary. Twelve months after the invasion of the Wimmera district fresh discoveries were made at Back Creek (Amherst), and the large area of productive ground opened up by the Talbot rush rapidly absorbed the unemployed. About this period, too, attention was first actively directed to the development of the quartz veins of the colony (hitherto subjected to the rudest method of operation) leading to the gradual discovery of the numerous rich gold bearing lodes distributed throughout the older diggings. The rush to Back Creek was followed by the opening up of Lamplough, and henceforward an almost uninterrupted succession of new fields greeted the miner. Old and New Inglewood, on the borders of the Murray Scrub, and Moonambel and Redbank, in the heart of the Pyrenees (the first celebrated for the number and value of its reefs), were closely followed by a considerable extension of the Burnt Creek diggings, the head-quarters of the Chinese in the Maryborough district.

Then came the more recent discoveries of Barkly, Landsborough, Navarre, Blue Mountain, Majoreca, and Sebastian, the latest and most valuable being the Raywood field, in the Bendigo district.*

The management of the gold fields of the colony is placed under a Mining Department, the head of which has a seat in the Legislative Assembly and also in the Cabinet. The gold fields are divided into six districts (Ballarat, Sandhurst, Castlemaine, Maryborough, Beechworth, and Ararat), each of which contains numerous divisions, and has a mining board and a court of mines. The Mining Board consists of ten members, elected from the different divisions of the district, whose functions are to make bye-laws to regulate the working of the gold mines in its district. These bye-laws are carried into effect by the wardens, who are officers appointed by the Government to administer the general affairs of the gold fields. The warden adjudicates in cases of mining disputes; from him there is an appeal to the Court of Mines. This is an equity court, presided over by a judge appointed for the purpose, called Judge of the Court of Mines, and who is also generally a county court judge. Mining surveyors are also appointed by Government, whose duties are to receive applications for and register prospecting claims; to assist in the formation of streets and the laying out of business sites on new fields; to collect statistics showing the mining population, machinery in use, &c.; to survey and prepare maps of the mines; and generally to report to Government every month on all questions relating to mining in their respective divisions.

From the granting of licenses to dig on the 1st of September, 1851, to the end of the year 1863, the mines of Victoria have produced gold to the value of nearly 130 millions sterling, exported in the following yearly quantities (see Table, next page).

It will be seen from this table, that while the returns of the first six years averaged over 11½ millions sterling, those of the latter six years, terminating with 1863, averaged but 8½ millions annually—*prima facie* evidence in favour of the supposition of a rapid deterioration of the gold fields.

* During the Maryborough rush, several parties prosecuted a search for gold in the district of Lake Omeo, in the Mitta-Mitta ranges, and some of the northernmost spurs of Gipps Land, without any important results.

† A new field of some pretensions (Indigo) was also opened this year in the Ovens district, but was taken up principally by residents of the adjoining divisions to Beechworth, and by persons from over the Border.

* A number of minor fields were also opened, but call for no special notice. The older gold fields, such as Korong, McIntyres, Kingower, Rushworth, McIvor, Korong Moliagul, Burnt and Jones Creeks, were opened in 1852-3. There are in all upwards of eighty distinct "diggings" in Victoria.

Year.	Ascertained Produce of Victoria, exclusive of Gold taken away by private hand.*			Value of the Produce, rated at 80s. per ounce.	Date.	Adult Miners, including Chinese.*	Total Population on the Gold Fields.
	oz.	dwt.	gr.				
1851	145,146	14	16	580,587	December, 1851	19,000	20,300
1852	2,724,933	5	1	10,899,733	" 1852	33,000	44,400
1853	3,150,020	14	16	12,600,083	" 1853	49,600	75,626
1854	2,392,065	9	19	9,568,262	" 1854	62,250	92,553
1855	2,793,065	8	16	11,172,261	" 1855	97,650	146,042
1856	2,985,695	17	0	11,942,783	" 1856	110,500	181,000
1857	2,761,528	8	0	11,046,113	" 1857	118,563	196,084
1858	2,528,187	19	12	10,112,752	" 1858	126,685	205,320
1859	2,280,675	13	0	9,122,702	" 1859	125,764	201,422
1860	2,156,660	10	0	8,626,642	" 1860	118,562	224,977
1861	2,244,452	0	0	8,977,808	" 1861	110,226	240,751
1862	1,817,408	0	0	7,269,632	" 1862	99,742	234,202
1863	1,634,377	0	0	6,537,508	" 1863	93,954	227,653

In order, however, to arrive at any practical conclusions on this subject, it will be necessary to review the experience of the past few years.

The yield of gold reached its maximum with the opening up of Dunolly and Ararat (1856-7), at which time also the greatest number of European miners were engaged, but with the decline of the advantages held out during the earlier years (the last great rushes in point of yield and extent, being the Wimmera fields) a gradual decrease took place. Large numbers availed themselves of opportunities to quit digging for more congenial pursuits, generally those remaining who were best fitted for the labours and to whom gold mining became a regular occupation.

Nor must the fluctuation in the numbers of this latter class, principally due to the attractions of other fields, be overlooked. The late rushes to New South Wales and New Zealand, for instance, present a more satisfactory explanation of the decline of the gold crop of Victoria, than is to be found either in the assumed impoverishment of the diggings, or in the ordinary displacement of mining labour. Nearly one-fourth of the European miners (chiefly alluvial†) have been thus withdrawn in the course of the past few years. It may also be stated that at no time subsequent to 1858-9 has there been an accession of fresh labour to the mining population of sufficient importance to materially influence the amount of yield. The partial replacement of the numbers withdrawn, has been maintained principally by a steady reflux of the out-going element.

These repeated migrations to remote and, as experience has invariably shown, inferior fields, are highly characteristic of the gold-seeking class, to whom, perhaps more than to any other, "distance lends enchantment to the view."

Far from any failure of auriferous indications in Victoria, fresh discoveries continue to be made, while the gold-bearing rocks present themselves as permanent sources of supply.

The table in the next column will best illustrate the strength of the actual mining population during the past twelve years.

Although the richest deposits hitherto found in Victoria were struck in the grounds first opened (and which has strengthened the impression of the early exhaustion of our gold fields), it may fairly be questioned whether

the real value of the later discoveries has been arrived at by the results obtained. For the purpose of illustration, we may compare the experience of this former period (at which time but little knowledge was possessed of the resources of the colony) with that of a later date. In the case of Mount Alexander, for instance, where the best yields were supposed to have been obtained with the least amount of labour, its development was gradual and continuous, extending over a period of two years or more.

Dating from the Trans-Loddon discoveries in 1854, the numerous fields successively opened (with perhaps one or two exceptions) have been "invaded" by a much larger body of miners than that which at any period thronged to those just quoted. The duration of a large rush rarely exceeding four or five months, a dispersion of the greater number will almost as rapidly ensue, the unsuccessful (necessarily a large proportion) betaking themselves to poor, but still remunerative fields—or, in mining parlance, "tucker" diggings—where they tide over the interval until the occurrence of another rush. Thus the large extent of country surrounding the productive centre is surrendered to what is really but a superficial examination; the practice of "shepherding," as pursued of late years, often preventing the development of what otherwise might prove to be rich and paying ground.†

It will be obvious, therefore, that the test of large areas, by operations thus systematically circumscribed, is utterly inadequate to determine their auriferous value, while the diversion of labour which necessarily attends a succession of "rushes," often widely separated, such as have occurred during the past few years, must operate prejudicially to the character of the yield.‡

(To be continued.)

* The numerical strength of the Chinese in Victoria may be stated at one fourth of the total mining population. Their immigration into the colony commenced in 1853, and in the following year there were about 2,000 located therein; this number during the next three years increased to 30,000; in 1858 their numbers throughout the year averaged 35,000; in 1859, 42,000; and in 1860 again fell to 35,000; but the several attractions of Lambing Flat and Burrandong in New South Wales drew away 10,000 or 11,000 during this and the following years, leaving the population throughout the past two years, in round numbers, at 24,000.

† The important localities of Dunolly, Creswick, and Talbot, together with the Burnt and Fiery Creek diggings, had been at one time more or less abandoned, after a partial and hurried trial, while as evidence of the wealth which yet lies untouched in the midst of diggings rushed long ago, it is only necessary to refer to the recent discoveries at Raywood (Bendigo), and Majorca (Maryborough).

‡ Looking at the recent discoveries in different parts of the colony, and the steady increase in the number of miners returning from New Zealand, there is a reasonable probability that this year's produce of the gold fields will exhibit a considerable improvement upon that of later years respectively.

* The amount of gold brought by hand from the gold fields to Melbourne, and taken away in passenger ships, without being passed through the customs, previous to the imposition of the export duty in 1855, has been estimated at 2,000,000 ounces. With this addition to the ascertained export of the precious metal we have a grand total of 126½ millions as the produce of the Victoria fields, or an average annual yield of better than 10½ millions sterling.

† It is estimated that 70 per cent. of the total yield of gold is derived from alluvial mining.

Fine Arts.

PICTURE SALES IN PARIS.—The last portion of the Piot sale exhibited some remarkable items; amongst others a portrait of Lord Chancellor Thomas More, by Hans Holbein the younger, seven inches in height, by about five in width, which brought £64. A series of sketches in Indian ink, heightened with white, by Meissonnier, of remarkable specimens of armour in the Musée d'Artillerie of Paris, fetched prices which show how great the reputation of this artist has become, one of these little sketches, that of a suit of engraved armour, designed by Jules Romain, having realized the sum of £80; the lowest figure obtained by these six drawings was £13 12s. At the same sale an ancient Greek bronze statuette, a figure of Agrippina, as Fortune, with a cornucopie in the left hand, fetched £240; and another small figure of Harpocratus, naked and leaning on the left elbow, with the index figure of the right hand on the lips, £128 16s. The former was found in the environs of Capua, about 30 years since, and formed part of the Teti collection; the latter formerly belonged to M. Duval, of Geneva, and afterwards to the late M. Louis Fould. A Greek statuette of the Plutus of Aristophanes, only six inches high, sold for £84. Three pictures by Diaz, "Scenes in the Forest of Bas-Bréau," fetched, at a sale the other day, £224.

INDUSTRIAL ART EDUCATION IN FRANCE.—The great efforts made of late in England to inculcate a knowledge and teach the elements of industrial art have caused the French government to look to its laurels, and to devise new methods of art education, and it has also given rise to several associations for that object. One of these, "La Société du Progrès de l'Art Industriel," which has for its president M. Viollet-le-Duc, the architect, has just appointed a commission to draw up a working plan for a Museum of Industrial Art, with galleries for permanent exhibition, sale-rooms, lecture-theatres, and library in the centre of Paris, and has issued an appeal to those interested in such matters for aid and advice.

THE EXHIBITION OF THE WORKS OF LIVING ARTISTS IN PARIS.—An analysis of the list of artists to whom medals have been awarded by the jury this year shows that of the painters thus distinguished 34 are French, 2 German, 2 Italian, 1 Belgian, and 1 Dutch; of sculptors, 13 are French, 1 Belgian, and 1 Prussian; in architecture all are French; and in engraving 6 are French, 1 Danish, and 1 German. There are amongst the exhibitors, English, Americans, Swedes, and others, but none of these have obtained a medal. The "Battle of Solferino," by Meissonnier, which is one of the gems of the exhibition, and which was painted by order of the Emperor, is to be placed in the gallery of the Luxembourg. The destination of the companion picture, by the same artist, "Napoleon in 1814," does not seem to be decided. They are both very extraordinary productions, giving effects on about two square feet of canvas which few artists have succeeded in producing on the largest scale. On a recent Sunday, when the exhibition was open to the public gratis, 22,000 visitors passed the wickets.

Commerce.

WASTE OF COAL.

By P. L. SIMMONDS.

The large demands now made upon our collieries, and the extending use of coal, should lead to a more thrifty system of working; and it is satisfactory to find that this subject, of the great waste of coal, has lately been occupying attention in many influential quarters. Rich as our stores of mineral fuel are, they should be worked and

husbanded with care, for we are told on authority that the time is not remote when we shall have to encounter the disadvantages of increased cost of working and diminished value of produce. The quantity of coal yearly worked from British mines has been almost trebled during the last twenty years, and has probably increased ten-fold since the commencement of the present century; but as this increase has taken place pending the introduction of steam navigation and railway transit, and under exceptional conditions of manufacturing development, it would be too much to assume that it will continue to advance with equal rapidity.

Mr. Robert Hunt tells us that the amount of coal raised in 1863 was more than 83½ million tons. The demand for fuel and for the condensation of steam, in our dwellings, factories, locomotives, and steam-vessels, is daily becoming more extensive, while eight million tons a year are now exported.

Mr. Hunt, in his "Mineral Statistics of the United Kingdom, for 1861," also informs us that two millions and a half of tons were wasted in that year in the process of working and burnt at the surface, in the collieries of Durham and Northumberland only. The total waste must, therefore, have been very large, although information thereof cannot be correctly obtained.

The late Dr. Buckland, in an address delivered to the Geological Society, in 1841, called attention to the wanton waste which for more than fifty years had been committed by the coal owners near Newcastle, by screening and burning annually, in never-extinguished fire heaps at the pit's mouth, more than one million chaldrons of excellent small coal, being nearly one-third of the entire produce of the best coal-mines in England. This criminal destruction of the elements of our natural industry, which is accelerating by one-third the not very distant period when these coal-mines will be exhausted, is perpetrated by the colliers for the purpose of selling the remaining two-thirds at a greater profit than they would derive by the sale of the entire bulk unscreened to the coal-merchant.

Sir W. Armstrong, the president of the last meeting of the British Association, dwelt very strongly upon this subject. "Were we (he said) reaping the full advantage of all the coal we burn, no objection could be made to the largeness of the quantity, but we are using it wastefully and extravagantly in all its applications. It is probable that fully one-fourth of the entire quantity of coals raised from our mines is used in the production of heat for inactive powers, but the average quantity of coal which we expend in realising a given effort by means of the steam-engine is about thirty times greater than would be requisite with an absolutely perfect heating engine.

"In those applications which are generally of a metallurgical nature the same wasteful expenditure of fuel is everywhere observable. In an ordinary furnace, employed to fuse or soften any solid substance, it is the excess of the heat of combustion over the body heated which alone is rendered available for the purpose intended. The rest of the heat, which in many instances constitutes by far the greatest proportion of the whole, is allowed to escape uselessly into the chimney. The combustion also in common furnaces is so imperfect, that clouds of powdered carbon, in the form of smoke, envelope our manufacturing towns; and gases, which ought to be completely oxygenised in the fire, pass into the air with two-thirds of their heating power undeveloped. Not less wasteful and extravagant is our mode of employing coal for domestic purposes. It is computed (adds Sir W. Armstrong) that the consumption of coal in dwelling houses amounts in this country to a ton per head per annum on the entire population, so that upwards of thirty millions of tons are annually expended in Great Britain alone for domestic use. If any one will consider that one pound of coal applied to a well-constructed steam-engine boiler evaporates ten pounds, or one gallon of water, and if he will compare this effect with the insignificant quantity of

water which can be boiled off in steam by a pound of coal consumed in an ordinary kitchen fire, he will be able to appreciate the enormous waste which takes place by the common method of burning coal for ordinary purposes. The simplest arrangements to confine the heat and concentrate it upon the operation to be performed would suffice to obviate this reprehensible waste. So also in warming houses, we consume in our open fires about five times as much coal as will produce the same heating effect when burnt in a close and properly-constructed stove. Without sacrificing the luxury of a visible fire, it would be easy, by attending to the principles of radiation and convection, to render available the greater part of the heat which is now improvidently discharged into the chimney."

In my work on "Waste Products," a year ago, I called attention to this subject, when I stated that "An immense amount of coal is wasted at coal mines by the process of breaking up the coal into the proper size for market. In this operation a large percentage of the coal is finely pulverised, and is thrown aside as unsaleable. This fine and wasted coal is of the purest quality. A correspondent of the *New York World*, writing from the Pennsylvania coal mines, states that at a single colliery, doing a good business, 400 tons of coal per day are made to pass through the machines for breaking up the lumps, and the waste is about 20 per cent., or 80 tons daily. All this amount has to be mined, brought to the breaker (two iron cylinders, with iron teeth, revolving in a horizontal position, parallel to each other, and about 10 in. apart), and, after this process of destruction, has to be carried away and piled up. One may see at any colliery, of several years' standing, enormous quantities of this now worthless article; very pyramids. All this, except what little is made in the mines by blasting, has to be paid for by the operator, and is a loss to the owner of the land, as well as the human family, and adds price to that which the consumer buys in the market. The waste in the collieries in Schuylkill and Luzerne counties, Pennsylvania, is believed to be over one million tons annually, worth £1,000,000. A small kind of coal, called Burgie, is used in this country for burning in engines. Coal dust or slack ground in a mill is manufactured in the districts of Manchester, Wigan, Rainhill, &c., and used by iron-founders exclusively for the mould. Burgie, the dust coal of the mines and screenings from house coal, is in Wales and other parts pressed into cakes of artificial fuel. Warlich's patent fuel consists of bricks made by compressing with an hydraulic press dust of coal, rendered coherent by bituminous matter, and partly charred. These bricks measure 9 by 6½ and 5 in., are dense, and require breaking before using. They burn with but little smoke, and form an excellent fuel, particularly where economy of room is an object, as they can be stowed very compactly. In many collieries no important use has yet been made of the dust coal. By similar treatment every pound of it might be saved, with a good profit to the manufacturer."

Whoever, observes Professor Booth (Smithsonian Report), witnesses the enormous amount of fine coal thrown in heaps near the anthracite mines, and allowed to be washed away by streams, must have regretted the waste of a quantity of fuel which will never be recovered. Many patents have been taken out in England with the view of saving fine culm, by mixing it with adhesive combustibles, such as coal-tar, &c., and pressing it into blocks. One patent proposes mixing dried and ground spent tan with rosin oil, and compressing into blocks. Another patent uses also refuse tan and peat with coal-tar, &c. But all these processes would seem to be ineffectual at the American anthracite mines, because not sufficiently economical in comparison with the price of coal. It is to be hoped that a process will yet be devised by which the fine dust and waste may be rendered equal in value to the pure anthracite, or even superior to it for some purposes where more flame is required. The use of plaster and

other like cement to unite fine coal into blocks or masses for fuel, as proposed by Hollands and Whittaker (in 1849), is objectionable, since it does not "add fuel to the fire," but ten per cent. ashes, in addition to the large amount of ash usually in fine culm.

It was recently stated at the Dudley and Midland Geological Society, by Mr. Rupert Kettle, the chairman, that by the improper working of the thick coal measures, only one-half of all sorts (coals, lumps, kibbles, and slack) were brought to the surface applicable for the purposes of use and sale. Thus an acre of thick coal, on the principle of working now adopted, is worth only £6,000, whereas, if the 36,300 tons were in the same shape as the 18,000 tons, it would produce £13,100. The same theory carried out in respect of the thinner measures would lead to the result that though a larger proportion of coal was brought out of those measures than out of thick coal, still the actual portion remaining in the earth, in comparison with the quantity brought to daylight, is so great that it is worth every attention that can be bestowed upon it, so that its working may be more economically effected.

Many of the inferior seams of coal can be worked only in conjunction with those of superior quality, and they will be entirely lost if neglected until the choice beds be exhausted. Although coal is private property, it was well observed by Sir W. Armstrong, that its duration is a national question, and Government interference would be justified to enforce such modes of working as the national interests demand.

The question is not how long our coal will endure before absolute exhaustion is effected, but how long will those particular coal seams last which yield coal of a quality and at a price to enable this country to maintain her present supremacy in manufacturing industry.

DANISH IMPORTS AND EXPORTS.—The imports into the United Kingdom from Denmark consist almost entirely of raw produce and consumable articles, the chief of which are butter, cattle, corn, oil seed cake, rapeseed, and sheeps' wool, the aggregate value in the year 1863 having amounted to £2,429,513. Compared with the aggregate of 1862, this return is larger by £264,473, although much less than the annual average of the last ten years. In 1862 there was a decrease in the importation of wheat of about 45 per cent., the value in that year having been £375,459, while in 1861 it amounted to £641,484. Butter, on the other hand, which in 1859 was imported to the value of £15,849; in 1860 of £49,351; in 1861 of £105,379, increased in 1862 to the value of £171,882. With the exception of hides, oilseed cakes, and salted pork, which exhibit considerable diminutions, the other commodities possess no noteworthy feature. The exports of British produce and manufactures to Denmark show a progressive increase since the year 1858, when their real value was £595,309. In the following year they increased to £723,978; in 1860 to £731,267; in 1861 to £912,807; in 1862 to the value of £941,771, and in 1863 to £1,005,321. The most prominent items in the list comprise coals, iron, cottons, and cotton yarn, linen and woollen manufactures. Of foreign and colonial produce exported the value averages about £200,000 annually, and consists mostly of coffee, cotton, indigo, sugar, tea, and wine. The number of Danish ships which entered the ports of the United Kingdom in 1,863, was 2,871, with an aggregate measurement of 278,338 tons, an increase on the previous year of 237 ships and 21,416 tons.

IMPORTATION OF CATTLE.—A considerable augmentation in the importation of cattle, &c., took place in the first three months of this year. Of oxen, bulls, and cows the number was 13,134, or 5,748 more than were imported in the corresponding period of last year, 1863: of calves, 3,634, an increase of 465; of sheep and lambs, 34,690, an increase of 10,765, and of 2,067, being 1,763 in excess of the number in the first quarter of last year.

Colonies.

QUEENSLAND. — POPULATION, REVENUE, &c. — The recent census shows the effects of the immigration which has prevailed during the last year or two. Taking, for instance, the towns of Brisbane and Ipswich, the comparative numbers are as follows: —

	On the 7th April, 1861.		
	Males.	Females.	Total.
Brisbane	3179	2872	6051
Ipswich	1667	1620	3287
	On the 1st January, 1864.		
Brisbane	6347	6052	12399
Ipswich	2292	2153	4445

These figures represent the inhabitants of the town portion of the police district of each place. It will thus be seen that in nearly three years the population of the capital of the country has been doubled; at the same time it must be borne in mind that the majority of the immigrants from Europe are scattered over the country districts. The revenue from all sources for the year 1863 was £309,112 8s. 9d., being an increase of £13,826 8s. on that for 1862. This increase does not bear such a high proportion to the total amount, nor is it nearly so much as that of preceding years, in which the revenue collected was as follows:—1862, £295,286; 1861, £238,303; 1860, £178,589. The revenue falls short of the estimates of two finance ministers. In May, 1862, Mr. Mackenzie, the first Colonial treasurer, estimated the revenue for 1863 at £317,200; in August last Mr. Moffatt, the present treasurer, estimated it at £350,000, exclusive of land orders. The revenue is, however, on the whole satisfactory. The customs receipts exhibit an increase of £29,091, the total amount for the year being £125,199; nearly two-thirds of this large sum was derived from spirits, wine, ale, porter, and beer of all sorts, in connection with which may also be specified the receipt of £8,179 for licenses to sell those liquors. That the commercial relations of the colony with other countries are rapidly increasing is unmistakably evidenced by the large increase realised from postage, £11,481; pilotage, harbour dues and fees, £2,260; and electric telegraph receipts, £4,120. It is under the head of land revenue that a serious falling off is seen. The total proceeds of the land sales during the year is set down at £135,614, less land orders £95,607; in other words, the actual cash payments into the treasury for lands purchased was £40,007, or £19,374 less than in 1862. In thus dealing with the land orders a large question for discussion is opened up. If the value of the land orders were included as receipts, the revenue for the year would appear as £404,720. The receipts from rents of land, assessment on runs, and surveys of runs, the only other items of land revenue, exceed by £5,762 those of the preceding year.—A Brisbane paper says that information of the highest importance, as affecting the future commercial interests of Queensland, has recently come to hand from the East Indian Archipelago. It is the proposed establishment, by the Dutch, of regular steam communication between Batavia, the seat of the general government of Netherlands India, and the several settlements of that nation in the Java and China seas, and the important British settlement of Singapore. The scheme is one of great magnitude, embracing not less than six main lines of steamers, irrespective of the branch lines connected with them. It is said the company have undertaken to procure from England a fleet of new steamers for the service, and that the Government have granted an annual subsidy of £30,000 during the term of the contract; and further, that they have advanced to the company the sum of £100,000, without interest, to enable them to enter upon the work with abundant means to secure success. The arrangements are proposed to fit in with those of the Peninsular and Oriental Company, whose steamers to and from China can be met with at Singapore. It is said that the Indian

press is unanimous in its approval of the scheme, and that speculations have been advanced that it will, above all things, be calculated to open a traffic with the new settlements that are to be established in North Australia. None of the colonists of Queensland are satisfied with the way in which the mails are conveyed to and from England. A material amendment is looked for in the northern route, in connection with the Dutch lines, supposing these lines were in working order.

GOLD.—A Sydney paper says:—"The quantity of gold delivered from the several gold fields, during the month of December, 1863, amounted to 28,226 ounces. For the corresponding month of 1862, the receipts reached 29,843 ounces. There is, therefore, a decrease on the month of 1,617 ounces, or about 5½ per cent. During the year ended 31st December, 1863, the amount of gold received has been 422,722 ounces, against 584,219 ounces in 1862. The decrease on the year is therefore 161,497 ounces, or 26 per cent. The falling off in the yield from the gold-fields is easily traced to the small quantities which have been received throughout the year from the Lachlan and Burrangong gold-fields. From the minor gold-fields, however, the receipts are up to the average, and in some districts, viz., Bathurst, Orange, and Stoney Creek, and the Northern gold-fields there is an increase in the quantity forwarded by escort. There is a decrease in the quantity of gold received from the Western gold-fields of 110,741 ounces, or 34 per cent.; and from the Southern, 60,200 ounces, or 26 per cent.; but from the Northern there is an increase of 9,444 ounces, or 35 per cent. Although during the past year the quantity of gold received is considerably below the year 1862, still there is a large increase on the receipts of the preceding years—the increase on the year 1861 being over 19,000 ounces, and in the year 1860, 67,000 ounces. The increase on 1853 is 250,000, and on 1856 nearly 290,000 ounces. Since the year of the gold discovery, 1851, the smallest amount of gold was received in 1855, when the average amount was 2,016 ounces per week, and the largest was in 1862, when the average reached 11,234 ounces per week."

NEW SOUTH WALES REVENUE.—The heads of revenue which show an increase are Customs duty on refined sugar and molasses, duty on spirits distilled in the colony, postage, licenses, fees of offices, fines and forfeitures, rents (exclusive of land), railways, electric telegraph receipts, pilotage rates and harbour dues, tonnage dues (Newcastle), rates under Chinese Act, commission on money orders, and miscellaneous receipts, and amount altogether to £119,455 3s. 6d. On the other hand there is a decrease in the revenue derived from gold, mint receipts, land revenue, interest on city debentures, amounting altogether to £176,819 17s. The decrease in the revenue is, therefore, to be attributed to the considerable falling off in the land revenue of £45,500, and in the gold and mint receipts of £52,700. The decrease is also swelled by the amount received in 1862 as interest on city debentures, and which was £48,261 14s. 6d. more than in 1863. It is satisfactory, however, to find that the customs revenue shows a slight increase of about £7,400, and this, together with the duty on refined sugar and molasses (which is placed under a separate head), makes the increase on dutiable articles amount to £22,000. On the duty on spirits distilled in the colony the amount received in 1862 and 1863 are about the same, the increase being only £7 14s. The receipts from railways and electric telegraphs show a marked improvement on the year 1862—the increase in the former being £33,747 18s., and in the latter £8,464 7s. The decrease and increase on the other heads of revenue are unimportant. The special receipts collected during the year 1863 amounted to £48,745 1s. 4d., against £41,858 17s. 8d. in 1862, being an increase of £6,886 3s. 8d.

SYDNEY EXHIBITION.—The medals awarded at the preliminary exhibition in Sydney, of articles that were intended for the International Exhibition of 1862, have been struck off at the Sydney Mint, and have since been

claimed by their respective owners. In addition to the silver and bronze medals, which already number 120, three medals have been struck in gold, to be presented respectively to Messrs. Carr and Company, Messrs. Gott and Company, and the Bradford Exhibition Committee, in acknowledgment of the presents of several elegant shawls and other fabrics manufactured from the wools of the colony. The medal is of pure gold, and weighs about 11½ oz., its value being nearly £50. The silver medals were made almost entirely of colonial silver, extracted from the gold brought to the Mint for coinage. One of the medals has been awarded to each of the local commissioners for their services.

THE SYDNEY MONEY MARKET has been rather tighter. This is probably caused by the amount that has lately been called up by those companies which have increased their capital, and also by the fact that there are other new companies, viz., the Bank of New South Wales and Hunter River New Steam Navigation Company, which intend to increase their capital. The amount required for this purpose is very large, and must for a time cause some demand for money. Besides this, debentures for a large amount have been issued by several companies, and there is also the possibility of the government stepping in at any moment with Treasury bills to the amount of £400,000. These facts are, therefore, sufficient to enhance the value of money for the present. The rates of discount charged by the banks still range from 7 to 10 per cent.

AGRICULTURAL DISTRESS IN NEW SOUTH WALES.—The smaller class of agriculturists in the counties of Cumberland and Camden have been reduced, by the loss of their wheat crop, in consequence of drought and rust, to a condition of comparative destitution. Three years since the crops in many places were destroyed by hailstones of unusual violence. The harvest of 1862 was lost from drought, and the wheat crop of 1863 was destroyed by rust. A very large and industrious class of the population has thus been placed in a position of great suffering. Last year the government came to their relief with about twenty thousand pounds worth of seed wheat and oats on loan. It was hoped that a good harvest would enable the struggling people to repay the advances thus made. This hope, however, has not been realised, and the people are now in a worse position than when they received the public loan. Meetings have been held, ostensibly with the view of asking that the government claim for repayment may be deferred, but, in reality, to bring the condition of the distressed farmers prominently before the public.

COAL OIL.—A private letter from Gaspe states that this product is supposed to exist in large quantities in that locality, but has not yet been tapped. Those engaged in boring for it have left off at over 700 feet without finding more than indications of its presence, and have begun boring in another place, hoping to strike upon it at a less depth.

NATAL SUGAR.—The year's crop is estimated to be not far short of 3,000 tons. The yield has been generally satisfactory. On very few estates less than a ton per acre has been averaged. On many two tons have been obtained, and several fields are cited as having yielded fully three tons per acre.

Obituary.

Dr. NORMANDY, long known as a practical chemist and an experimental philosopher, died on the 10th instant, in the 54th year of his age. He was a Frenchman by birth, but resided in England. Originally educated for a surgeon, he passed the necessary examinations, but having in the course of his studies been led into chemical experiments, he found a greater attraction in their pursuit. While so occupied he formed an intimate friendship with the late Dr. Ure, with whom he was subsequently associated in many important chemical investigations, and he

became well known for his chemical acquirements. Dr. Normandy was the author of several works, amongst which may be mentioned "An introduction to Rose's Chemistry" (he also edited an English translation of that work); "The Handbook of Chemistry;" "A Treatise on Agricultural Chemistry;" "Guide to the Alkalimetric Chest;" "The Chemical Atlas," a work of great value to students of chemical analysis;" "The Dictionary of the Chemical Atlas." He also contributed to the new edition of Dr. Ure's "Dictionary of the Arts and Manufactures." He was the inventor of a very successful apparatus for use on shipboard, for distilling fresh water from salt water.

Publications Issued.

THE EXHIBITED MACHINERY OF 1862; a cyclopædia of the machinery represented at the International Exhibition, by D. K. Clark, C.E., M. Inst. C.E., late Superintendent of the Western Annex, International Exhibition, 1862, &c. (*Day and Son*.) This book has been written for the purpose of supplying a descriptive and critical analysis of the machinery exhibited at South Kensington in 1862. The descriptive particulars are, for the most part, based upon the observations of the author, who, as Superintendent of the Machinery Department, had frequent opportunities of examining the machinery. In addition, he has availed himself of the co-operation of exhibitors in verifying and authenticating the descriptive matter of this work, to whom, in the majority of instances, proofs for that purpose were submitted, and these gentlemen willingly responded to the author's applications. Upwards of eleven hundred machines and portions of machines have thus been accurately noticed, or described in detail, so that, in fact, the work constitutes a compact Cyclopædia of Machinery, valuable as a text-book for students, and as a work of reference for engineers. In the arrangement of this work, the author has, in general, followed the classification of machinery adopted by Her Majesty's Commissioners for the International Exhibition, and comprehended in the official Industrial Catalogue. Part I., on Railway Plant, embraces the contents of what has been known as Class 5. Part II., on the Machinery for Manufacturing Textile Fabrics, embodies the contents of Class 7a. Part III., on the Manufacturing Machines and Tools for Working in Iron, Wood, and other materials, relates to the contents of Class 7b. Part IV., on Machinery in General, to the contents of Class 8. With every disposition to compress the matter of this volume within smaller limits, it has, nevertheless, been extended to nearly one-half more than the space originally assigned for it, as it was found that those limits could not be observed without injuriously curtailing the book. In fact, the volume might easily and profitably have been extended to double the size. The wood-cuts and plate-engravings, which are very numerous, will be found of great utility in illustrating the text. The Plan of the Western Annex shows the arrangement of the machinery department as prepared and carried out by the author for Her Majesty's Commissioners; it will possess considerable interest, particularly for those who were identified or associated with that department. The drawing from which the plan has been reduced, was carefully made for the author by Mr. John Cundy, Deputy-Superintendent of the Annex. A number of machines were drafted to the Eastern Annex, for want of space in the Western, which accounts for the absence of these machines from the plan.

FARMING IN INDIA, by Lieut.-Col. Greenaway, of the Madras Staff Corps. (*Smith, Elder, and Co.*) This work is intended especially for those Europeans of a superior class who purpose taking up farming in India as a pursuit. It embodies the experience of an intelligent officer in the Indian service, who, on his return to England, was much

struck with the want of accurate information on Indian subjects, more especially those connected with that country as a field for the enterprise of European settlers. He found, by the objections commonly raised, that the subject was not understood, and was obscured by prejudices and various notions, which there was no accessible information to correct. Hence this book, which briefly and plainly communicates facts upon such points of Indian living and Indian farming as an intending settler should thoroughly understand before making up his mind to embark himself and his capital upon such pursuits. It gives minute information on the construction of buildings, reservoirs, irrigation and drainage works,—matters of vital importance to the Indian farmer, and which, in ninety-nine cases out of a hundred, he will have to see to himself. The work is comprised in twelve chapters, treating respectively of the land and climate of India, the character of the natives, the causes of the failure of Europeans, a general view of Indian farming, wet farming, irrigation, and drainage; dry farming, hill farming, buildings, plant, and machinery; live stock, farm servants, and the author's *resume* and conclusions. The work is illustrated with plans for the construction of drains, tanks, weirs, sluices, and is contained in 132 pages.

OYSTER FISHERY (*Alexander Thom*, Dublin, for Her Majesty's Stationery Offices).—This work has been compiled and published with the sanction of the Commissioners of Public Works, for the information of persons interested in oyster-fisheries, and contains the laws which regulate the oyster-fishery and cultivation in Ireland, showing the capabilities of that country and the means of overcoming natural difficulties in connection with the propagation and growth of the oyster, being chiefly a reprint of articles from various sources of information. The object is to diffuse a practical knowledge of the means whereby oysters may be most abundantly produced in the best marketable condition, and the oyster-fishery developed to the extent demanded by its importance as an abundant source of food and employment. The best available authorities have been cited, and the opinions of persons who have given the subject the greatest consideration have been printed, without comment or addition, so that the statements made rest entirely upon the authority of the respective writers. Copious extracts are given from the able pamphlets of Dr. Kemmerer, of the Isle of Ré, and the admirable and exhaustive work of M. Coste, "*Voyage d'Exploration*," from which the illustrations have been chiefly adopted; and obligations are also due to Mr. Thomas Ashworth for many valuable communications.

Notes.

ALEXANDRA PARK.—A correspondent writes:—"This undertaking bids fair soon to add another boon to the hardworking artizan, and to offer him an 'outing' of a truly country character, for the elevation which forms the site is tufted in all directions with beautiful trees, especially oak, and there is no intention of felling any of them, or of cutting the sward up into gardens as at the Crystal Palace, so that he and his children may roll on the grass and 'lie under the greenwood tree' to perfection, while materfamilias looks on in quiet complacency. The top of the hill is now being levelled into a spacious platform, on which the palace itself is to rise, and from which a magnificent and varied view offers itself in all directions, the great city being in the distance, over which may be seen the rural glistening beauties of the Crystal Palace, and all round some of England's loveliest scenery. It is no venture to say this, for while from this principal hill scenery is presented similar to that from Richmond or Leith hill, in Surrey, one needs but descend a little valley and rise again to another smaller hill, also the property of the company, to find oneself in a spot fully

wooded, on a steep descent, so retired and luxuriant, and bold in its slope, that it is more like Devonshire than the neighbourhood of London, inasmuch that one almost expects to see a rattling trout or salmon river through the under-wood in the gorge below. These, however, are features not to be transplanted, but instead of them, in descending again one comes on a fine race-course, every point of which can be distinguished from the principal hill, which, on such occasions, will afford a grand-stand for the million. Besides this there is a good cricket ground. Various lesser buildings are rising in the grounds, but the first column of the principal edifice is not to be raised till next month. The park is easily accessible from Farringdon-street to the Wood-end station on the Great Northern line, which runs at the foot of the hill, but the intention is eventually that railway communication should reach the palace itself, on the top of the hill, and this not from one quarter alone but from several. A fine and liberal feature of the plan is the cheapness at which this holiday boon is to be offered to the poorer public, while to the richer, Grove-house and its grounds, on the neighbouring hill, will afford those refinements of selection they desire, among which will be the creature comforts of an excellent restaurant. At present the estate is quite a country place, full of butter-cups, birds, and timber trees, and so it is to be left, with the addition of one spacious and other lesser buildings, and the various arrangements for exercise and sport which the promoters of the undertaking intend to provide for the active and merry tastes of the public, without interfering with the present rural character of the grounds."

NORTH LONDON WORKING CLASSES INDUSTRIAL EXHIBITION.—On Tuesday, 23rd May, a public meeting was held in St. Bartholomew's Schoolroom, Hayes-place, Lower-road, Islington, for the purpose of adopting measures for getting up a working classes industrial exhibition for North London. The meeting was presided over by Mr. William Harvey. Mr. Lovell, sen., the hon. secretary, read a statement setting forth the objects of the exhibition and the steps which had been already taken to carry it out. Seeing the success which had attended an exhibition of a similar character in South London, which was opened during last March, several persons in the northern districts of the metropolis had conceived the idea of attempting one of a like nature, where the working men in these districts might exhibit the products of their skill and ingenuity. A preliminary committee had been appointed, who had taken up the matter in a most cordial manner; and, in order to place it fairly before the working classes, they had convened the present meeting. The exhibition would consist of articles of utility and art, the production of working men, and the rules which had been framed for carrying out the arrangements were generally similar to those which had regulated the South London Exhibition. Resolutions to the effect that the scheme for promoting an industrial exhibition for the North of London deserved the hearty co-operation of all classes, and that the meeting pledged itself to support, by every means in its power, the establishment of such an exhibition, were carried unanimously.

NEW SCIENTIFIC ASSOCIATIONS IN FRANCE.—Much has been done of late in France towards the furtherance of pure and industrial art by means of private enterprise. Several associations are now in active operation, and others are being carried into effect. It is a greater novelty to see the same principle applied to abstract science. The scientific, like the artistic world, has been roused to the truth that the state is incompetent to supply all that is demanded by the spirit of *discovery*, and the former, like the latter, has determined to test the value of independent enterprise. M. Leverrier, the Imperial astronomer, proposed, some time since, to found, with the assistance of the official visitors of the observatory, a grand prize in meteorology, and issued a circular letter to the scientific world on the subject, which seems to have received an encouraging reply, for the

same gentleman has now set on foot an association for the advancement of astronomical and meteorological science in general. The scheme is drawn on a grand scale, and this will probably ensure its success. A large number of scientific men were consulted on the proposition in question, and this consultative body—consisting of members of the Institut, of the Meteorological Society, professors of the Observatory, scientific writers, medical, and other scientific men—has given its positive adhesion to the scheme. The fundamental laws of the association have been drawn up by this body, and the new association may be looked upon as launched. The authorities have sanctioned it, and the “Association for the Advancement of Astronomy and Meteorology” is now an existing fact. The society is at present governed by a provisional committee numbering about fifty persons. Its mission is, not to discuss or study science itself, but to encourage others in that study by furnishing the necessary instruments for that object, and also by the moral force of its united members as well as by the material power of its subscribed capital. In order to open the doors of the association as wide as possible, and to give to it the widest and firmest basis, it will not only have a list of regular subscribing members, but will admit the public to its meetings at a fixed rate. The annual subscription of the former is fixed, for the present, at the very low rate of ten francs a year, and the admission to each sitting at two francs per visitor. The association has its rooms at the Imperial Observatory, and an office at the Meteorological Society, in the Rue Fleurus, and the founders express the fullest confidence in the success of the undertaking. The first operations of the new association are already planned out. The laws of meteorology are yet to be evolved, and with the view to stimulate inquiry, with this end in view, a grand prize is to be founded. A committee is now sitting to determine upon the conditions and the amount of this prize. As to astronomy, the grand necessity recognised by the association is the construction of instruments of high power; the materials and the principles of construction are ready, the means alone are wanting. It is considered eminently desirable that observers, with good instruments, should be established in all directions, especially under the clear sky of the south, and therefore the association has at once voted a sum of 50,000 francs, for its portion of the cost of production of a telescope with an opening of 75 centimètres, or 29·5 inches English. The society also undertakes to obtain from the authorities of the town where this instrument is to be set up, a further portion of the amount of the cost, and it is expected that the State itself will also lend its aid.

PATENT OFFICE LIBRARY AND MUSEUM.—Mr. Dillwyn has moved for in the House of Commons, and obtained a committee to inquire into the condition of the Patent Office Library and Museum. The names of the committee are as follows:—Mr. Dillwyn, Mr. Cowper, Mr. Gregory, Mr. Knight, Lord Robert Cecil, Lord Henry Lennox, Mr. Ayrton, Mr. Augustus Smith, Lord Elcho, Mr. Waldron, Mr. Adderley, Mr. Walter, Mr. Calthorpe, Mr. Holford, and Mr. Francis Sharp Powell.

DRAINAGE OF THE METROPOLIS.—The engineer of the Metropolitan Board of Works has reported that at the present time about one-sixth of the metropolitan sewage is intercepted by the northern outfall sewer works, and discharged into the Thames at ebb tide at Barking, whence it is carried to the sea. This sewage, about 14 million gallons in quantity, has hitherto been discharged into the river Thames at low water, within the limits of the metropolis.

Correspondence.

LABOURERS' COTTAGES.—SIR,—The difficulty as to the provision of cottages for labourers at a price to be mutually advantageous, does not appear to have been solved by the

recent discussion, nor by the numerous designs in competition for Mr. Denton's prize. This is owing to too much being expected. According to several, if not most of the plans, the labourer is to be provided with pantry, scullery, and, in some cases, with bakehouse. In the estimates for the selected designs I observed about £20 for plumber's work. These are unnecessary obstacles. The chief object is, or should be, to provide a comfortable sitting-room, with, for families, three bed-rooms, and this may be gained, at a comparatively small cost, by a cottage of four rooms, with a lean-to for scullery purposes, washing, &c. The upper floor should be two bed-rooms, front and back, the lower floor a sitting-room and bed-room. All cooking, including baking, may be done by a good range with oven, which is economical of fuel, such as Sir Thomas Dyke Acland, has provided for his cottage tenants in the neighbourhood of Broad Clist. The lean-to might contain fuel, with a sink for washing, and with an earthen or iron tank, or tub, with iron fall-pipes for rain water. The plumber's bill should be very little. Any other water supply might be for a row of cottages in common. It is much better to be content with moderate improvements that are practicable, because they may be commercially successful, than, by striving for more that if possible would be desirable, really obtain less. In Leeds there is a small society which purchases a plot of land, builds, on the best terms it can, a block or row of cottages; these, when finished, are offered to working men at cost price, house and land freehold, a portion to be paid by the purchaser, and the remainder by the Leeds Permanent Building Society. The latter is reimbursed by a weekly rent, payable for about thirteen years, at the expiration of which the house and land become the freehold of the working-man. Such a system is not practicable in rural districts, but is worth attention in towns. As each row of houses has been sold, or nearly so, another is commenced, and the society has already erected nearly a hundred comfortable and commodious cottages.—BARNETT BLAKE.

BAROMETERS.—SIR,—In your *Journal* of the 1st of April appears a description of a so-called new barometer, which, I think, will be found accurately described in the following extract from the *Encyclopædia Britannica*, 7th edition, 1842, and written by Sir J. Leslie:—“The most accurate construction of a barometer of this kind [the conical barometer, invented by Amontons, 1695] is attained by joining together two tubes that have even but unequal bores, the longer and narrower being uppermost. If the width of the upper tube were supposed to be, to that of the under one, as two to three, the scale would be enlarged three times, since, by descending three inches from the top, and, consequently, two at the bottom, the column would suffer a contraction of one inch in height. This species of barometer is thus recommended by its simplicity and its ample range. But the bore of the tube being indispensably small, the mercury moves with difficulty, and resists impressions of minute changes of external action.” Also, page 400—“A modification of the conical barometer in travelling we have ourselves employed. The principal part consists of a small steel stopcock, a glass tube 31 or 32 inches long, with a bore of the tenth of an inch, sealed at top and filled with quicksilver, is cemented into the one end of the stopcock, and into the other end is cemented an open and wider tube, 16 inches or more in length, and having its diameter above the eighth of an inch. This compound tube is lodged in a walking-stick, divided into inches and tenths through its whole extent, or only at the upper part.” It will thus be seen that this barometer was invented and published more than 20 years since, and, if necessary, I could mention persons, both in London and elsewhere, who have made them, but probably they have not been much used, from the defect alluded to, which cannot be got rid of, except by using a larger tube, and having a moveable piston in the bottom, on Whiting's plan, as exhibited by Mr. Becker last year at the soirée of the

Royal Society. Mr. Becker informed me, and, no doubt, others as well, that Whiting had also made them, as described above, with the small tube. Mr. Becker's instrument led, no doubt, to the recent revival of this kind of barometer; but while, perhaps, as a matter of business, it may be thought legitimate for any maker to introduce, in connection with his own name, an instrument not generally known in the trade, it was hardly to be anticipated that the Royal Society should lend the sanction of their authority to the introduction of an instrument as new which was published more than twenty years since in a by no means obscure work. The above quotations appear also in the eighth edition of the *Encyclopædia*.—I am, &c., W. SYMONS.

VIBRATION IN STEAMERS.—SIR,—It is not a little surprising that, although steam-boats have been in constant use for so many years, nevertheless the vibration, which passengers find so unpleasant, and which is so destructive to the vessels and so expensive to the owners, should still remain a puzzle to the engineer? Yet so it is. Not one of the many writers on the subject has suggested even a plausible explanation of the phenomenon. With regard to paddle steamers, indeed, the notion that the oscillatory movement was caused by the beat of the paddle-boards as they successively struck the water, has hitherto passed muster—but this could not apply to the screw. If the screw were completely immersed, the resistance offered by the water to its revolution, whatever might be its nature, ought at least to be regular—there would be nothing vibratory about it; yet the screw steamers are found to shake even worse than the paddle steamers. What could be the cause of this anomaly no one seemed able to tell. Some attributed it to the length of the shaft through which the force of the engine was transmitted to the screw. But in many large factories the length of shafting may be reckoned by furlongs instead of yards; yet the power of many hundred horses is transmitted in all directions, horizontally and perpendicularly, over a vast area, and up to the seventh story of a large edifice, which would be shaken to pieces in a day by one-fiftieth part of the vibration experienced in a moderate-sized screw-steamer. What could occasion so great a difference in the result under circumstances that appeared identical? This is a question which all steamship owners will acknowledge to be of the utmost importance, though it has never hitherto been answered. And yet the reason seems to be very simple. While expending a vast amount of ingenuity in perfecting the details of their machines, our marine engine-makers have overlooked the all-important fact, that, in their case (as distinguished from the land engine), when they cause the piston to rise and fall within the cylinder they have to deal with *two* moving bodies instead of *one*. On land the cylinder rests on the solid earth, and is fixed; but on board a ship the cylinder is not fixed, and cannot, by any possibility, be fixed—since, however massive may be its framework, the ultimate foundation is the bottom of the ship, which is essentially a moving body. The natural consequence is this: Whenever steam is admitted below the piston its elastic force tends to press the bottom of the cylinder downwards, just as much as it impels the piston upwards—and, as both yield to the pressure, they both move in opposite directions, and through spaces corresponding to the *momenta* of their respective resistances. The piston rises, and the cylinder—*id est* the vessel altogether—sinks. Just the reverse action ensues as the piston descends, and this “up and down” action recurs upon every revolution of the shaft. How enormous is the oscillatory force thus exercised may be easily computed. Take, for example, a 45-inch cylinder (a very common size for engines in the mercantile navy), and suppose that the medium pressure of steam throughout the stroke is 25lbs. per circular inch including vacuum. This gives an aggregate pressure of 50,000lbs. (or more than 22 tons), operating alternately upward and downwards with every revolution of the engine. The effect

on the vessel is actually equivalent to that produced by the beat of a steam hammer of more than 20 tons, vibrating from 80 to 100 or 150 times per minute. No wonder that the ship shakes under such discipline. No wonder that splendid steamers return after a short cruise with their sterns rattled to pieces. Engine-makers have devoted much ingenuity to what they call “balancing” their cranks. This is straining at the gnat and leaving the camel still to be swallowed. They must “balance” their steam before they can pretend to have remedied the existing evil.—I am, &c., A. J. JOYCE.

18, Gower-street.

MEETINGS FOR THE ENSUING WEEK.

- Mon.** ...British Architects, 8.
 Asiatic, 3. Annual Meeting.
 R. United Service Inst., 8½. Captain Edmund A. Ingfield, R.N., “On a proposed Plan of Working the Heaviest Ordnance on board Armour-plated Ships and Fortifications, with complete Protection for the Men.”
- Tues.** ...Civil Engineers, 9. President's Annual Conversazione.
 Anthropological, 8.
- Wed.** ...Royal Inst., 3. Professor Marshall, “On Animal Life.”
- Thurs.** ...Antiquaries, 8.
 Royal Inst., 3. Mr. John Hullah, “On Music.”
 Linnean, 8.
 Chemical, 8. Prof. Stokes, “Discrimination of Organic Bodies by their Optical Properties.”
 R. Society Club, 6.
- Fri.** ...Philological, 8.
 Royal Inst., 8.
 Archæological Inst., 4.
- Sat.** ...Royal Inst., 3. Mr. Alex. Herschel, “On Falling Stars and Meteorolites.”

PARLIAMENTARY REPORTS.

Par.
 Numb.

- 55 (5). Railway and Canal Bills—Sixth Report from Committee.
 227. Superannuations (Persons now employed in any public capacity)—Return.
 240. Army Chaplains, &c.—Return.
 170. Superannuations (Public Offices)—Account.
 82. Bills—Customs and Inland Revenue (amended).
 83. — Union Assessment Committee Act Amendment.
 63. — Naval Agency and Distribution (amended).
 64. — Naval Prize Acts Repeal (amended).
 65. — Naval Prize (amended).
 84. — Writs Registration (Scotland).

Delivered on 3rd May, 1864.

215. Education (Mr. Morell)—Copy of Correspondence.
 85. Bill—Under Secretaries Indemnity.

Session 1863.

509. Island of St. Vincent—Copy of Correspondence.

Delivered on 4th May, 1864.

- 62 (3). Committee of Selection—Fourth Report.
 241. Militia Regiments (Establishments, &c.)—Return.
 252. Primrose-hill Meeting—Return.
 247. Poor Law Sarah Dove)—Return.
 87. Bills—Joint Stock Companies (Foreign Countries).
 88. — Admiralty Lands and Works.

Delivered on 5th May, 1864.

172. Works and Public Buildings—Abstract Accounts.
 229. West Riding of Yorkshire Assizes—Returns.
 232. Foreign Sugar—Account.
 250. Banks (Scotland)—Return.
 256. Seamen's Savings Banks—Account.
 East India (Substantive Law)—First Report of Commissioners.

Delivered on 6th May, 1864.

217. Excise and Customs (Ireland)—Returns.
 222. Highways Act—Copies of Memorials.
 244. Metropolis Turnpike Roads—Thirty-eighth Report of Commissioners.
 251. New Zealand Loan—Copy of a Letter dated 29th December, 1858, &c.
 86. Bills—Superior Courts of Common Law (Ireland).
 92. — Public and Refreshment Houses (Metropolis).

Delivered on 7th and 9th May, 1864.

230. Vestry Cess (Dublin)—Return.
 249. East India (Officers of Native Regiments)—Return.
 259. Civil Bill Courts (Carrickfergus)—Return.
 255. Merchant Seamen's Fund—Account.
 257. Mercantile Marine Fund—Account.
 263. Fortifications, &c.—Account.
 266. East India (Mr. Burgess)—Correspondence, &c.
 279. Civil Services—Supplementary Estimate (Class I).
 246. British Museum—Accounts and Estimate.

89. Bills—Boiler Explosions.
 90. „ Street Music (Metropolis).
 94. „ Limited Penalties.
 91. „ Pier and Harbour Orders Confirmation.
- SESSION 1863.
- 493 (5). Import and Export Duties—Return (Part 6).
Delivered on 10th May, 1864.
236. Police Inquiry (Dundrum)—Return.
 254. Public Buildings (South Kensington)—Return
 North America (No. 11)—Return of Claims of British Subjects.
 North America (No. 12)—Correspondence respecting the Enrollment of British Seamen at Queenstown.
Delivered on 11th May, 1864.
- 55 (6). Railway and Canal Bills—Seventh Report from Committee.
 258. Ramsgate Harbour—Statement of Receipts and Payments.
 261. Tenure and Improvement of Land (Ireland)—Abstracts of Returns.
265. Decimal System of Measures, &c.—Return.
 269. Thames Conservancy—General Report.
 272. Public Meetings (Metropolis)—Return.
 273. Established Church (Ireland)—Return.
 98. Bills—College of Physicians.
 99. „ Railways (Ireland) Acts Amendment.
 100. „ Drainage and Improvement of Lands (Ireland).
 102. „ Valuation of Rateable Property.
Delivered on 12th May, 1864.
204. Education—Return.
 238. Grand Jury Presentments (Ireland)—Abstract of Accounts.
 264. Illicit Distillation (Ireland)—Return.
 275. Law Life Society—Return.
 276. Military Savings Banks—Account.
 289. Civil Service Estimates—Abstract showing the Grants to be proposed.

Patents.

From Commissioners of Patents Journal, May 20th.

GRANTS OF PROVISIONAL PROTECTION.

- Anchors—1129—A. V. Newton.
 Anchors, construction of—1103—W. I. Meacock.
 Aniline colours, substitute for—993—D.H. Lomer.
 Animal charcoal, treatment of—1119—E. Beanes.
 Arches, bricks used in the formation of—1077—J. Davidson.
 Armour-plating and batteries of war—1067—C. O. Papengouth.
 Artificial fuel, manufacture of—1118—W. Smith.
 Blast furnaces—1185—M. Morgans.
 Boilers, &c.—1063—L. E. C. Martin.
 Boots and shoes, protecting parts of—1155—J. H. Johnson.
 Bottles, apparatus for securing stoppers for—1128—J. Thompson.
 Bottles, jars, &c., apparatus for stopping—1187—N. Thompson.
 Building, treating clay, artificial stone, &c., for—1076—R. H. Smithett and J. Davidson.
 Buildings, connecting bricks together in—1078—R. H. Smithett.
 Buildings, material for roofing or covering—1169—J. F. Empson.
 Carriages, application of brakes to—1130—W. Jarvis.
 Cartridges, filling, closing, and finishing—1122—Y. Parfrey.
 Churning, apparatus for—1052—E. Taylor.
 Collar and neck-tie, combined—1025—E. S. Simon.
 Crinolines and trimmings—1167—E. Tombs.
 Drags and carriages—1120—J. McDowell.
 Dress, new article of—1157—J. H. Johnson.
 Dried fruits, apparatus for cleaning—1091—J., T. J., and J. Parker.
 Electric telegraphs—1071—G. Schaub.
 Engines, motive power—1173—F. H. Wenham.
 Engines, steam and caloric—1099—M. P. W. Boulton.
 Fabrics, holding and stretching—1165—E. Heywood.
 Fats, seeds, &c., apparatus for pressing—1100—J. L. Norton, F. Gregory, and J. Salmon.
 Fibrous materials, separating the woody parts from—1115—D. Nevill and W. Coppin.
 Figured fabrics, looms for weaving—1102—J. H. Johnson.
 Fire-arms, breech-loading—1163—W. Powell.
 Fire-engines, floating—1127—M. Coghlan.
 Food, preparing and preserving—1082—J. McCall and B. G. Sloper.
 Fuel, motive power by the combustion of—1112—M. P. W. Boulton.
 Gas burners, chimney for—1094—R. A. Brooman.
 Gas, furnaces used in the manufacture of—1087—F. C. Hills.
 Gas, purification of, &c.—1088—F. C. Hills.
 Grain or seeds, screens for cleaning—1104—G. Gell and W. Caferata.
 Hair brushes, revolving—1098—J. Bessac.
 Hats perfectly grease-proof—1075—F. T. Aldridge and M. J. Jackson.
 Hinges for ships' ports, &c.—1069—A. Notman.
 Iron and steel, manufacture of—1114—E. H. Newby.
 Iron, manufacture of—1083—W. C. Cambridge.
 Iron, manufacture of—1143—J. Shortridge.
 Kitchen boilers, self-acting valves for—1064—J. Cookson.
 Lamps, miners' safety—1121—B. Hammerton.
 Lamps, ornamenting the globes and shades of—1101—J. Hunt.
 Medicinal substances, inhalation of—1161—A. V. Newton.

- Medicines, capsulation of fluid—1073—M. A. F. Mennons.
 Metals, machinery for planing—1116—R. Thompson.
 Motive power, apparatus for obtaining—1085—J. Harvey.
 Note books, counter slip—1109—J. O. Bradley and R. Fielding.
 Omnibuses, &c., applying motive power in the traction of—1153—J. Tomlinson.
 Ordnance, &c., projectiles for—1079—J. Corry, jun.
 Ores, &c., apparatus for washing—1107—P. A. L. de Fontainemoreau.
 Ornamental fabrics—1090—J. K. Crawford.
 Pavements—1080—J. Little.
 Petroleum oils, &c., arranging steam boilers and furnaces for burning—1131—C. J. Richardson.
 Photographic pictures and marble papers—1111—A. W. Gittens.
 Puddling furnaces—1145—J. H. Poole and J. Astbury.
 Pumps, construction of—1105—F. S. Barker.
 Punching machines—1159—J. Cameron.
 Railway break apparatus—1141—I., J., C., L., and M. Jefferson.
 Railway carriages, &c., roof lamps for—1086—D. C. Davies.
 Railway carriages, &c., springs for—825—E. Lindner.
 Railways, atmospheric—1195—A. Allison and J. Halliwell.
 Reaping and mowing machines—1189—J. Moore.
 Refrigerators—1123—W. McVitie.
 Seats, cushions, &c., springs used in—1054—L. A. Durrien.
 Seaweeds, treatment and application of—1072—T. G. Ghiallin.
 Sewage matters, utilisation of—1191—T. Walker.
 Ships, apparatus used in the repairing of—1023—W. E. Newton.
 Ships, masting of—1147—J. Turnbull.
 Steam cultivation—1117—R. Garrett, jun.
 Steam engines—1139—G. Haseltine.
 Sunken vessels, &c., apparatus for raising—1084—J. C. Browne.
 Tanning—1095—R. A. Brooman.
 Telegraph wires and cables—1126—W. T. Henley.
 Textile fabrics, stamping and embossing—1110—S. Shaw and H. Fishwick.
 Umbrellas—1175—W. G. Haig.
 Ventilating apparatus—937—T. Steven and C. Batty.
 Vessels, construction and propulsion of—871—W. B. Adams.
 Vessels, plating and sheathing for—1135—H. H. Henson.
 Vice, construction of—1070—A. V. Newton.
 Washing, blue colouring matters for—1125—T. H. Rees.
 Wheels—1137—R. A. Brooman.
 Wheels, construction of—1066—R. Melling, jun.
 Wood, &c., production of alcohol from, and paper manufacture with the fibre of—1081—R. A. Brooman.
 Work boxes—1096—J. Miessey.

INVENTION WITH COMPLETE SPECIFICATION FILED.

Screws, manufacture of—1214—G. T. Bousfield.

PATENTS SEALED.

- | | |
|--|-----------------------------------|
| 2948. J. Platt. | 3079. W. Wanklyn. |
| 2949. G. W. Yapp. | 3095. W. M. Cranston. |
| 2951. D. W. Rea. | 3121. W. Livingstone. |
| 2955. J. Lewis. | 3131. E. Solvay. |
| 2963. G. Parkin. | 3171. J. Smith. |
| 2969. H. B. Barlow. | 3195. W. B. Adams. |
| 2970. D. Kirkaldy. | 3213. W. H. Tooth. |
| 2971. R. Laming. | 52. A. J. S. Graham. |
| 2979. W. C. Brocklehurst, and J. and J. Creighton. | 60. D. Pidgeon and W. Man-waring. |
| 2988. S. and T. Smith. | 87. J. Wheatley. |
| 3003. C. Pontifex. | 173. C. T. Woodman. |
| 3017. G. Glover. | 538. E. Hall. |
| 3062. R. Hornsby, jun. | 599. S. Blackwell. |
| 3054. B. Hornsby, jun., and J. E. Phillips. | 605. J. Clayton. |
| 3071. M. Turner. | 677. J. Daughish. |

From Commissioners of Patents Journal, May 24th.

PATENTS SEALED.

- | | |
|----------------------------------|---|
| 2968. J. H. Wilson. | 3013. H. Lumley. |
| 2972. J. Thorpe. | 3015. W. Clark. |
| 2973. J. Simmonds. | 3019. T. Mallinson. |
| 2974. J. Baker. | 3029. H. Holdredge. |
| 2975. J. Nadal. | 3043. E. Stevens. |
| 2977. J. Chesterman. | 3123. J. Corby. |
| 2978. J. A. R. Main. | 3217. E. Tangye. |
| 2980. T. Gray. | 99. W. Hanlon, G. Hanlon, T. Hanlon, and A. Hanlon. |
| 2982. J. Bateman and D. Bateman. | 377. T. Smith and T. Lister. |
| 2985. J. Clark. | 795. W. E. Newton. |

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

- | | |
|-----------------------|------------------------------------|
| 1261. A. Allan. | 1305. L. Lumb & W. H. Butterworth. |
| 1339. G. Asher. | 1306. C. Nuttall. |
| 1334. G. H. Birkbeck. | 1314. C. Batty. |

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

- | | |
|-------------------------------|-------------------|
| 1400. C. F. Vasserot. | 1459. T. Silver. |
| 1405. J. F. P. L. Von Sparre. | 1726. S. Fox. |
| 1413. J. Hardley. | 1428. E. C. Kemp. |
| 1450. S. Fox. | |